



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/799,503

03/11/2004

Yang Gao

0160113

8334

53375 7590 01/05/2011

FARJAMI & FARJAMI LLP  
26522 LA ALAMEDA AVE.  
SUITE 360  
MISSION VIEJO, CA 92691

EXAMINER

SERROU, ABDELALI

ART UNIT

PAPER NUMBER

2626

MAIL DATE

DELIVERY MODE

01/05/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/799,503	GAO, YANG	
	<b>Examiner</b>	<b>Art Unit</b>	
	Abdelali Serrou	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,14-22,24-28 and 30-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,14-22,24-28 and 30-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### **Response to Amendment**

1. In response to the office action mailed on 6/18/10, applicant filed an amendment on 10/18/10, amending claims 1, 4-10, 12, 14-20, 22, 24-26, 28, and 30-32. Claims 2, 13, 23, and 29 were previously cancelled. The pending claims are 1, 3-12, 14-22, 24-28, and 30-50.

### **Response to Arguments**

2. Applicant's arguments filed 10/18/10 have been fully considered but they are not persuasive.

Applicant argues that the prior art Kroon does not teach transmitting each of said plurality of voicing indexes as part of each of said plurality of CELP speech frames and in addition to said CELP coding parameters including line spectral frequencies, pitch, fixed codebook gain, adaptive codebook gain and fixed codebook parameters; wherein each of said plurality of voicing indexes provides information from said encoder to said decoder for controlling one of an adaptive high pass filter, an adaptive perceptual weighting filter, an adaptive Sine window by said decoder, a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook, a perceptual weighting filter, a linear prediction coder, a pitch enhancement fixed-codebook and a post pitch enhancement.

As best understood by the examiner, the voicing index is an index, representing the degree of periodicity and/or periodic harmonic band boundary of a voiced speech, sent to the decoder for harmonic speech coding (specification, page 6, lines 14-16). The voicing index also is represented by a set of three bits indicating the classification of the speech such as background

Art Unit: 2626

noise, periodicity, noise-like or unvoiced speech signal. These indexes are used to improve one of a) fixed-codebook short-term enhancement including the spectrum tilt, (b) perceptual weighting filter, (c) sub-fixed codebook determination, (d) LPC interpolation, (e) fixed-codebook pitch enhancement, (f) post-pitch enhancement, (g) noise injection into the high-frequency band at decoder, (h) LTP Sinc window, (i) signal decomposition, etc (specification, page 4, lines 10-15).

Kroon teaches measuring periodicity of a speech signal (col. 3, line 21-25) by a pitch - period processor (col. 5, lines 39-40) to generate an index M representing periodicity for each CELP frame. This is done at the encoder stage (col. 4, line 47). At the decoding stage (col. 6, line 1), the periodicity index submitted by the encoder is used yield a vector for application the fixed codebook gain amplifier and to generate the adaptive codebook contribution vector V (n) (col. 6, lines 23-55). These vectors and others are supplied to the postprocessor to control the post processing and harmonic filters of the synthesized speech signal (subsections II.4.2.1 – II.4.2.4, col. 27 –col. 29) such as a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook control and adaptive gain and high pass filter control as in col. 29, line 7-67).

Therefore, Kroon teaches voicing indexes submitted by the encoder to the decoder controlling one of an adaptive high pass filter, an adaptive perceptual weighting filter, an adaptive Sine window by said decoder, a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook, a perceptual weighting filter, a linear prediction coder, a pitch enhancement fixed-codebook and a post pitch enhancement.

As per the rest of the claims, and combinations of prior art reference, applicant has no

Art Unit: 2626

further arguments beside the ones mentioned above. Therefore, all the combinations of prior art reference mentioned above are valid, and all other claims are rejected for the same reasons as set above.

### **Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 3-10, 12, 14-20, 22, 24-26, 28, 30-32, and 34-50 are rejected under 35**

U.S.C. 102(b) as being anticipated by Kroon (USPN 5,664,055).

**As per claim 1**, Kroon teaches a method for improving synthesized speech quality in a speech coding system including an encoder and a decoder (Figs. 3, 4) comprising:

obtaining an input speech signal by an encoder (Fig. 3 correspond to the encoding part, wherein a speech signal is received by preprocessor 100);

coding said input speech signal by said encoder using a Code Excited Linear Prediction coder to generate coding parameters for synthesis of said input speech signal (Fig. 3, and corresponding cols. 4 and 5 , wherein a CELP encoder is encoding an input speech signal);

generating a plurality CELP speech frames by said encoder, each of said plurality CELP speech frames including CELP coding parameters (col. 6, lines 1-22, wherein the decoder receives transmitted CELP speech frames that include CELP coding parameters as in table 9);

creating a plurality of voicing indexes by said encoder wherein each of said plurality of voicing indexes relates to a characteristic of said input speech signal (cols. 7-10, wherein the

Art Unit: 2626

decoder make use of all coded parameters and indexes, including voicing indexes, provided by the encoder. The encoder of Fig. 3 uses both Fixed Code Book (FCB) (unvoiced) and Adaptive Code Book (ACB) (voiced). Both, (FCB) and (ACB) got voicing indexes relating to a characteristic of said input speech signal); and

transmitting each of said plurality of voicing indexes as part of each of said plurality of CELP speech frames and in addition to said CELP coding parameters including line spectral frequencies, pitch, fixed codebook gain, adaptive codebook gain, and fixed codebook parameters (cols. 7-10, especially col. 9, lines 20-40, wherein the decoder extracts parameters indices from a received bit stream transmitted by the encoder. The parameters include line spectral frequencies, pitch, fixed codebook gain, adaptive codebook gain, and fixed codebook parameters), wherein each of said plurality of voicing indexes provides information from said encoder to said decoder for controlling one of an adaptive high pass filter, an adaptive perceptual weighting filter, an adaptive Sine window by said decoder, a spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook, a perceptual weighting filter, a linear prediction coder, a pitch enhancement fixed-codebook and a post pitch enhancement (Kroon teaches measuring periodicity of a speech signal (col. 3, line 21-25) by a pitch -period processor (col. 5, lines 39-40) to generate an index M representing periodicity for each CELP frame. This is done at the encoder stage (col. 4, line 47). At the decoding stage (col. 6, line 1), the periodicity index submitted by the encoder is used yield a vector for application the fixed codebook gain amplifier and to generate the adaptive codebook contribution vector V (n) (col. 6, lines 23-55). These vectors and others are supplied to the postprocessor to control the post processing and harmonic filters of the synthesized speech signal (subsections II.4.2.1 – II.4.2.4, col. 27 –col. 29) such as a

Art Unit: 2626

spectrum tilt of said input speech signal by short-term enhancement of a fixed-codebook control and adaptive gain and high pass filter control as in col. 29, line 7-67).

**Regarding claim 12**, Kroon teaches:

receiving a plurality of Code Excited Linear Prediction (CELP) speech frames by said decoder from said encoder (Figs. 3-4 and col. 4, lines 31-46);

obtaining a plurality of CELP coding parameters by decoding each of said plurality of CELP speech frames by said decoder (col. 4, line 31 –col. 6, line 55);

obtaining a plurality of voicing indexes in addition to said CELP coding parameters including line spectral frequencies, pitch, fixed codebook gain, adaptive codebook gain, and fixed codebook parameters by decoding each of said plurality of CELP speech frames by said decoder wherein each of said plurality of voicing indexes relates to a characteristic of said input speech signal (cols. 7-10, wherein the decoder extracts parameters indices from a received bit stream transmitted by the encoder. These parameters include line spectral frequencies, pitch, fixed codebook gain, adaptive codebook gain, and fixed codebook parameters (col. 9, lines 20-40). Also, the decoder makes use of all coded parameters and indexes, including voicing indexes, provided by the encoder. The encoder of Fig. 3 uses both Fixed Code Book (FCB) (unvoiced) and Adaptive Code Book (ACB) (voiced). Both, (FCB) and (ACB) got voicing indexes relating to a characteristic of said input speech signal); and

generating a synthesized version of said input speech signal using said plurality of CELP coding parameters and said plurality of voicing indexes by said decoder (column 1, lines 43-64 with column 4, line 49 - column 6, line 55).

Regarding **claims 3 and 14**, Kroon discloses a method and encoder wherein at least one

Art Unit: 2626

of said plurality of voicing indexes provides information from said encoder to said decoder for controlling the adaptive high pass filter by said decoder (high pass filter; column 4, lines 49-64 and column 27, lines 49-67).

Regarding **claims 4 and 15**, Kroon discloses a method and encoder wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive perceptual weighting filter by said decoder (adaptive perceptual weighting filter; column 8, lines 39-54).

Regarding **claims 5 and 16**, Kroon discloses a method and encoder wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling an adaptive Sinc window by said decoder (Sinc; column 20, lines 4-15).

Regarding **claims 6 and 17**, Kroon discloses a method and encoder wherein said enhancing at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling spectrum tilt (spectral envelope tilted; column 17, lines 29-35) of said input speech by short-term enhancement of a fixed-codebook by said decoder (short-term; column 8, lines 31-37).

Regarding **claim 7**, Kroon discloses a method and encoder wherein said enhancing said synthesis of at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a perceptual weighting filter by said decoder (column 4, lines 49 – column 5, line 8).

Regarding **claims 8 and 18**, Kroon discloses a method and encoder wherein said enhancing at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a linear prediction coder by said decoder (LP; column 4,



Art Unit: 2626

lines 49-64).

Regarding **claims 9 and 19**, Kroon discloses a method and encoder wherein said enhancing said synthesis at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling a pitch enhancement fixed-codebook by said decoder (fixed codebook coupled to a pitch filter; abstract and column 27, lines 11-17).

Regarding **claims 10 and 20**, Kroon discloses a method and encoder wherein said enhancing said synthesis of at least one of said plurality of voicing indexes provides information from said encoder to said decoder for controlling post pitch enhancement by said decoder (post-filtering; column 27, lines 49-67).

Regarding **claims 34 and 37**, Kroon discloses a method and encoder wherein each of said plurality of voicing indexes has a plurality of bits indicative of a classification of each frame of said plurality of CELP speech frames (column 23, lines 31-59).

Regarding **claims 35 and 38**, Kroon discloses a method and encoder wherein said plurality of bits is three bits (3 bits; column 23, lines 29-33).

Regarding **claims 36 and 39**, Kroon discloses a method and encoder wherein said classification is indicative of periodicity of said input speech signal (periodicity classification; column 30, lines 1-65).

Regarding claims 22, (24, 30), (25, 31), (26, 33), 28, (40, 43), 41, and 44, respective system claims 1, (3,14), (4,15), (5,16), 12, (34,37), (35,38), (36,39) and method claims 22, (24, 30), (25, 31), (26, 33), 28, (40, 43), 41, and 44 are related as apparatus and the method of using same, with each claimed element's function corresponding to the claimed method step. Accordingly claims 22, (24, 30), (25, 31), (26, 33), 28, (40, 43), 41, and 44 are similarly rejected

Art Unit: 2626

under the same rationale as applied above with respect to method claims 1, (3, 14), (4,15), (5,16), 12, (34,37), (35,38), (36,39).

Regarding **claims 45**, Kroon discloses a method and encoder wherein said periodic index ranges from a low periodic index to a high periodic index (column 30, lines 1-65).

As per **claim 46**, Kroon teaches wherein said plurality of voicing indexes is used in place of pitch gain for post pitch enhancement (Abstract).

As per **claim 47**, Kroon teaches wherein said plurality of voicing indexes are used to control a modification to a low pass filter for said Sinc window (col. 20, lines 4-15).

**As per claims 48-49**, Kroon teaches wherein each of said plurality of voicing indexes is derived from a normalized pitch correlation parameter  $R_p$ , where  $-1.0 < R_p < 1.0$ , (col. 20, lines 4-15, wherein normalized pitch correlation vectors are used. As per the claimed range, the examiner notes that correlation is statistic representation of how closely two variables co-vary; it can vary from -1 (perfect negative correlation) through 0 (no correlation) to +1 (perfect positive correlation). Therefore, the claimed range is a standard range to be used).

### **Claim Rejections - 35 USC § 103**

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 11, 21, 27 and 33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroon in view Morii et al. (PGPUB 2006/0206317).

Art Unit: 2626

Regarding **claims 11, 21**, Kroon discloses a method of improving synthesized speech quality, but does not explicitly disclose a method and encoder wherein at least one of said plurality of voicing indexes is for use by said decoder to select at least one sub-codebook from a plurality of sub-codebooks.

Morii discloses a method and encoder wherein at least one of said plurality of voicing indexes is for use by said decoder to select at least one sub-codebook from a plurality of sub-codebooks (sub-codebooks, paragraphs [109]-[110] with paragraphs [49]-[56]), to achieve an excellent sound quality at the time of decoding.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kroon's method and encoder as described above, to correspond to input signals with various characteristics and achieve excellent sound qualities at the time of decoding (abstract).

**Regarding claims 27 and 33**, system claims 11 and 21 and method claims 27 and 33 are related as apparatus and the method of using same, with each claimed element's function corresponding to the claimed method step. Accordingly claims 27 and 33 are similarly rejected under the same rationale as applied above with respect to method claims 11 and 21.

**Claim 50** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kroon in view of Kandhadai et al. (US 20030028373 published Feb. 6, 2003).

Kroon teaches all the limitations of claim 1, upon which claim 50 depends. Kroon does not explicitly disclose wherein at least one of said plurality of voicing indexes provides information from said encoder to said decoder for bi-directional pitch enhancement.

Art Unit: 2626

Kandhadai in the same field of endeavor teaches using bi-directional pitch enhancement (forward and backward pitch enhancement, Abstract, and [0046])). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to use the bi-directional pitch enhancement of Kandhadai with the system of Kroon, in order to improve the perceptual quality of output speech by obtaining pitch continuity between frames.

### **Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See Form 892.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdelali Serrou whose telephone number is 571-272-7638. The examiner can normally be reached on 8:30-5:00.

Art Unit: 2626

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James S. Wozniak can be reached on 571-272-7632. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Abdelali Serrou/  
Examiner, Art Unit 2626

/James S. Wozniak/  
Supervisory Patent Examiner, Art Unit  
2626